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USABILITY EVALUATION OF AN EDUCATIONAL WEBSITE IN SAUDI ARABIA

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ABSTRACT. *Despite the widespread use of online applications and websites, inadequate attention is paid to their usability aspect. Always there is a need to evaluate the usability of these applications and website specially the educational one to improve their user friendliness. The idea behind this research is to evaluate the usability of an educational website in Saudi Arabia. For this research we have considered a number of ways of usability evaluation, but find user based method [7] specifically Heuristic evaluation method to be easier and more cost effective way to evaluate the usability of educational websites. A questionnaire was developed to accumulate the data. Then survey is conducted based on this questionnaire, by providing this questionnaire to different undergraduate students in one of the universities in Saudi Arabia.*

Keywords: Usability Evaluation; User Interface Evaluation; Heuristic Evaluation.

1. Introduction. Educational websites are destined to provide information to a wide variety of users. Users of these types of websites are mainly concerned with the ease of finding information in a timely manner [5,14]. This need led to achieve high level of usability. Usability is considered to be the most important factor in assessing the quality of web application user interface along with some other quality measures as security and reliability [3, 16]. The race to develop more user friendly web applications has paved a way for a number of methods and tools to cope with the usability problems [4]. In addition, a wide number of usability evaluation methods are developed to evaluate the user friendliness of an interface [6]. Usability evaluation methods are divided into the following main categories [7,15]:

1. **User Based Methods:** Users are directly involved in process of finding usability problems. This method combines the aspect of assessing user satisfaction and performance (using interviews, questionnaire and observation) with the identification of the problems in the interface.
2. **Evaluator's Methods:** A number of usability experts (evaluators) are taking part in this type of usability evaluation to judge an interface. Heuristic Evaluation is the most widely used method in this category.
3. **Tool based Methods:** Use of various software tools to automatically identifying the problems in user interface. Most of these tools assess the quality of the HTML code of a website by considering a number of guidelines.

The aim of this research is the implication of user based method of usability evaluation to figure out the usability problems in educational website. Here we have taken King Abdul Aziz University Saudi Arabia website as our case study.

2. Related Work. This section covers some of the found literature covering the usability of educational websites. There are numbers of usability evaluation methods that are used in the literature to figure out usability problems in the websites.

Noiwan and Norcio [9] in (2000) by using web usability checklist, evaluated the usability of two Thai and two US academic websites. Main aim was to compute the usability index. The checklist was categorized into four major parts: Finding the information, understanding the information, supporting user tasks, and pre-

senting the information. As a result, they came up with number of usability problems as Lack of a site map, old content, lack of navigational tools, and inconsistency.

Kostas and Xenos [11] (2006) implied the heuristic evaluation method to evaluate the usability of an academic website. Methodology behind the work was to use the nelson guidelines for finding the usability issues against each guideline principle given by Neilson [1].

Mustafa and Al-Zouabi [8] in 2008 by using questionnaire and online automated tools figured out the usability problems in nine different university websites of Jordan. They have arranged their questionnaire by listing about 23 criteria for website usability evaluation. Then these identified criteria were divided into five major categories: Content organization and readability, Navigation and links, User Interface design, Performance and effectiveness and Educational Information. For each category there is usability index that was calculated and on the basis of computed index usability level were determined. Some of the automated tools are also used to find the usability problems automatically.

Toit and Bothma [10] (2010) by using the heuristic evaluation method examined the usability of the website of a department in the University of South Africa. They also came up with number of usability issues as poor navigation, inappropriate search, old content etc.

Lyla Hassan [12] also applied heuristic evaluation method for finding the usability problems in three Jordanian websites. She used the questionnaire which was divided into five major categories: Navigation, Architecture, Ease of Communication, Design and content. Questionnaire was given to about 237 students of a university. She also used expert review method to evaluate the usability of these websites and at the end came up with a lots of usability problems in these websites.

A case study was conducted by the Website Usability Testing Center at Wisconsin-Stout University [13] to evaluate the usability of their University's website www.uwstout.edu. The idea was to assess the usability of their university website using some qualitative testing methods.

3. Main Methodology. In order to evaluate the usability of King Abdul Aziz website using Heuristic Evaluation, two methods were used: Expert Review and Survey Study. For this purpose a heuristic guideline document was developed. Heuristic guideline document was produced by combining the comprehensive heuristic guidelines provided by Nielsen [Ref1], and the heuristics developed by Hasan [Ref2]. These heuristic are specific to the educational websites. Based on these documents, heuristics were divided into five major categories: Navigation, Design, Content, Ease of Use and supporting the user tasks. These major categories are further divided into some sub categories shown in the following table:

Table 1. Heuristics Categories & Sub Categories

Major Categories	Sub Categories
Navigation	Working & Reliable links, No Misleading Links, No Orphan Pages, Navigation back to home page, Appropriate internal search, Ease of Navigation
Design	Consistency in Language, Consistency in Architecture (Format, font, layout), Aesthetic design (site having professional look & feel), Proper use of images, Appropriate choice of colors. Appropriate menu design & menu selection criteria, Appropriate use of headings, Correct Sequence of Presentation, Acceptable readability level
Content	Foreign Language Support, Current & appropriate information, No spelling/ grammatical errors, Brief & relevant information/headings, Heading reflecting tasks, No under-construction pages.
Finding the information (Ease of Use)	Online admission forms, Feedback form is Available, Simple Domain Name, Availability of course catalogue, Information about University (phone no, fax , address etc.), Quick Downloading of pages, Easy interaction with website
Supporting User Tasks	Forms are shorter, forms are easy to follow, Help Facility, Search is relevant and quick, pages work fine on different browsers, Sharp Layout

Based on the above mentioned categories and sub categories, a questionnaire was developed. Then survey is conducted based on this questionnaire, by providing this questionnaire to different undergraduate students in one of the universities in Saudi Arabia. The demographic data of the participants compiled from the survey, have been illustrated in the table below:

Table 2. Participant Analysis

Item	No	Percentage
Gender		
• Male	50	31.64
• Female	108	68.35
Age		
• 18-29	142	89.87
• 30 and above	16	10.12
Experience of Computer & Web Usage		
• Less than 3 years	12	7.60
• More than 3 years	146	92.40
Knowledge of Usability Engineering		
• Yes	130	82.27
• No	28	17.72

It shows that majority of the respondents are female students, and around 92% are having the computer and web usage experience of more than 3 years. It shows that they have an appropriate knowledge of computer and it can also be shown from the table that majority are familiar with usability aspect of the interfaces.

4. Results. Our questionnaire was divided into five major categories and every category is having varying number of questions. Following are the results shown by each category.

Table 3. Category Navigation

Queries	Sub Cat	Agree (%)	Disagree (%)
All Links are working	A	21	79
All pages have navigational menu or link to other pages in the site.	B	26	74
There is no misleading links (the destination page which was opened by the link was same as expected by the user).	C	24	76
Links causing menu to disappear (there is any link which when selected causing main link to disappear).	D	27	73
Orphan pages (the site has some dead end pages, that doesn't have link to any other page).	E	16	84
Links to site map are correct.	F	57	43
There is Navigation back to home page on every page.	G	10	83
There is Navigation up and down within a page.	H	34	60
Internal search is effective and working?	I	51	49

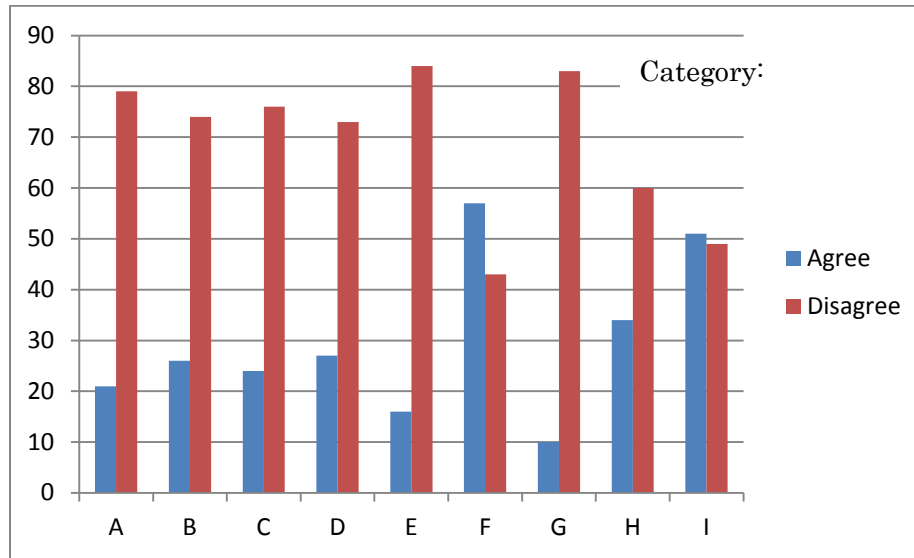


Figure - 1: Category Navigation

From the above table and graph it can be easily seen that in the category navigation, users responded with many problems. In this category we have asked almost 10 questions from the users named them as sub categories (A, B,C, D, E,F, G, H and I). 79% of users are of the opinion that their all links are not working. 76% of the responders reported the misleading links. 73% of the participants are of the opinion that there are some links that may cause other links to disappear. 84% of the users are of the opinion that, there are many dead pages in the website.

Table 4. Category Design

Queries	Sub Cat	Agree (%)	Disagree (%)
Inconsistency in the language of the interface (links at English interface open pages that displayed Arabic content and vice versa).	A	87	13
Figures and tables are aligned correctly	B	15	85
Font Style is same throughout the website.	C	2	98
Font Size is same throughout the website.	D	0	100
Layout of the website is very simple.	E	18	82
Are icons concrete and familiar?	F	38	62
Are icons labelled?	G	49	51
Consistent Colors throughout website?	H	17	83
Menu design is consistent.	I	26	74
Menus are highlighted when they are selected.	J	60	40
Pages are printable with an average size paper.	K	67	33
Colors are used appropriately.	L	12	88
The alignment of the header on each page is consistent.	M	36	64
All pages have proper headings.	N	30	60
The quality of all images is good.	O	21	79
Headings are task based.	P	59	41
Presentation is in correct sequence.	Q	16	84
Readability level is acceptable	R	29	71
Text is simple, concise, and clear.	S	24	76

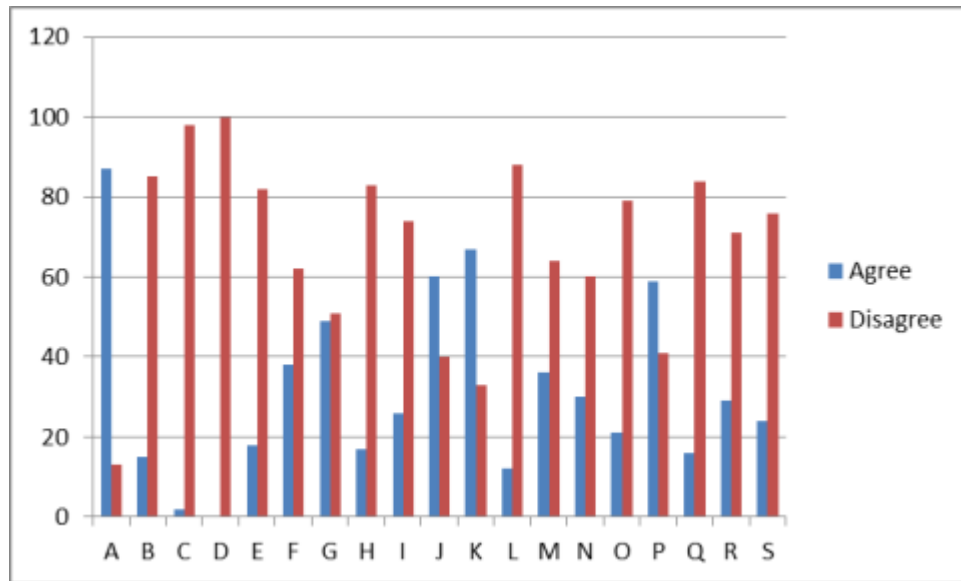


Figure - 2: Category Design

In the category of design, as indicated by the table, about 80% of the users reported inconsistency in the language of the interface. There is some text in Arabic in English version of the website and vice versa. More than 80% didn't find tables and figures aligned properly. Almost all of them reported inconsistency in the font style and size throughout the website. More than 80% of the participants found website design not that simple. There is also some conflicts between the participants responding to the subcategory of familiar icons. 38% of the participants found them familiar, while rests are in opposite opinion. Same results can be seen in almost all categories. Respondents are of the opinion that the design of the website doesn't fulfill the usability criteria.

Table 5. Category Content

Queries	SubCat	Agree	Disagree
Foreign Language Support is available?	A	100	0
Information is current?	B	21	79
Information is complete (no missing information).	C	99	1
The site has pages with empty content. (Is there any blank page on the website without any information?)	D	98	2
Is there any misspelling of words?	E	0	100
Site has some punctuation errors?	F	93	7
Headings within page are labelled correctly.	G	50	50
Headings are brief and informative.	H	51	49
At least one heading exist on every page.	I	61	39
Headings accurately reflect task or information.	J	61	39

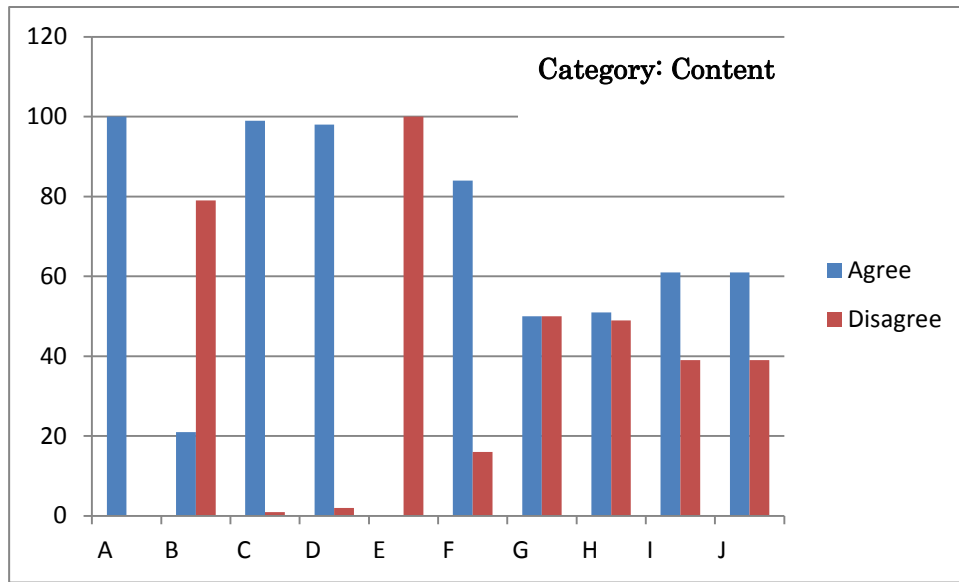


Figure - 3: Category Content

By Heuristic evaluation method, there are about 8 problems which are identified in the category of content. First is related to the fact that the information on the website is old. For example the page of admission is outdated showing date of as update as 6/5/2013 while study is carried out in January 2015. Second problem is related to the missing information, almost all of the responders replied that they did not find their relevant information. Respondents are of the opinion that most of the pages of the website are empty. 93% of the users responded that there is no punctuation used even the information is in the form of paragraph and is too long.

Table 6. Category: Ease of Use

Queries	Sub Cat	Agree (%)	Disagree (%)
Online admission application is available?	A	5	95
Giving feedback and asking questions are facilitated.	B	80	20
Online course catalogue is included.	C	63	37
The site has simple domain name.	D	100	0
Phone number, fax number, e-mail, and postal address are included on each page.	E	89	11
Help facility is provided.	F	89	11
Information about services, departments/units, and programs are clearly described.	G	77	23
Capitalization, spelling, and punctuation are correct.	H	1	99
University's sports' options are included.	I	91	9
Class schedules are provided.	J	12	88
Link to campus current events is included.	K	99	1
Site map is included.	L	100	0
The home page contains main category headings that are descriptive and short.	M	89	11
A search tool is included on the site.	N	100	0
A user can find an answer within 10 seconds.	O	38	62
The date of the last updated is included at the bottom of every page.	P	100	0

For online admission application 90% of the participants replied with No, rest of the 5% are of the opinion that online admission application is available for the Arabic version of the website. For the second sub category about online facility of asking question is available or not. 80% of the people replied that this facility is available but in Arabic. Rest of the 20% responded that this facility is only available in Arabic, so they consider that no feedback and asking question facility is there on website. For online course catalogue 63% responded that they find their respective course catalogues but rest of the people replied that course catalogue is available for some departments, for others we didn't find the catalogue. There are links on the website for course catalogue but are empty. For having the simple domain name all of them are agreed on the point that site is having a simple domain name. For contact information and help facility respondent have come up with the same results. They are of the opinion that for help a link to FAQs is available but the page against this link is empty. But we can find FAQs by searching them implicitly. 77% of the respondents find the information about their respective departments, while others replied with No. About Capitalization, spelling, and punctuation, almost all of them replied that all of these three things are not correct. Especially for capitalizations, on the main menu they are using some Capital and some small letters. About University's sports options most of the respondent find the options on the website but some of them replied for some specific department they were unable to find the sports option. Same is the case for class scheduling, some of the respondents find the class schedule for specific subjects while others were unable to find. Some respondents were able to find the answers within 10 seconds while for others it was taking a long time to do this.

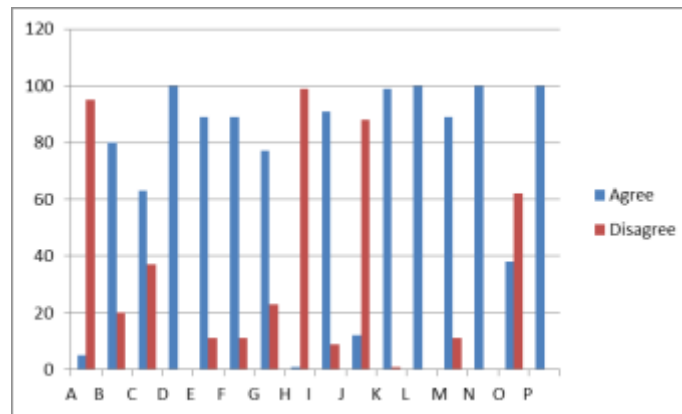


Figure - 4: Category Ease of Use

Table 7. Supporting User Tasks

Queries	Sub CAT	Agree	Disagree
Reply forms are shorter than one page	A	56	44
Frequently Asked Questions (FAQ) is included.	B	99	1
Home page displays within 10 seconds.	C	2	98
Search results are displayed within 10 seconds.	D	99	1
There is advance notice before downloading large files.	E	1	100
The pages work on different browsers.	F	60	40
Images are relevant, interesting, and not crowding	G	4	96
Layout is sharp and not crowded with words.	H	4	96

54% of the users find the reply forms shorter, while others reported that some of the forms are so long that they need so much of scrolling. A link to FAQs is available but the page against this link is empty. But we can find FAQs by searching them implicitly. Respondents are of the opinion due to heavy images in the background site is taking so much of time to load. There is no advance notice before downloading the large files. All of the pages of the website are not working fine on all browsers; some of the items are not at their original location when users are switching from IE to chrome. For images and layout I can be seen that most of the people find them very crowded and less interesting.

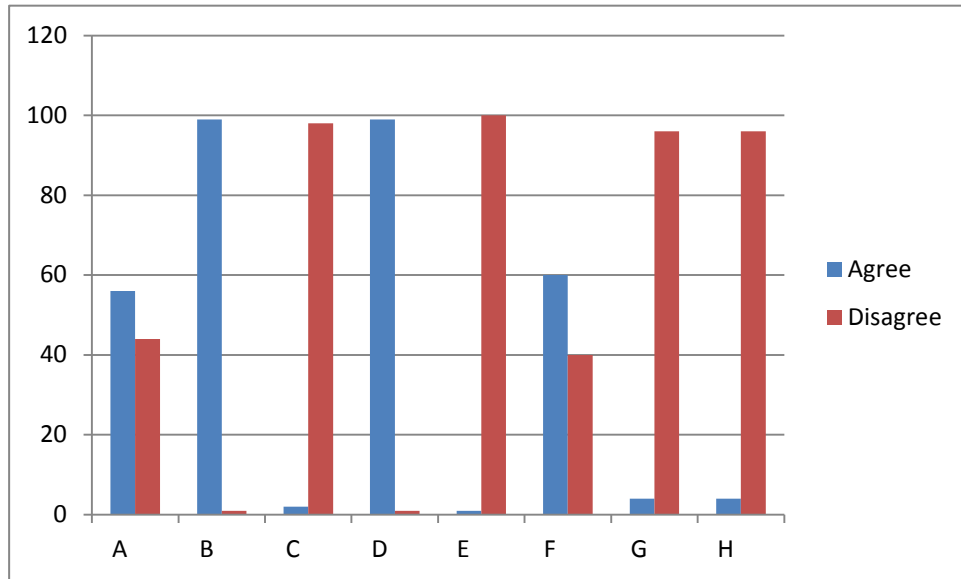


Figure - 5: Supporting User Tasks

Table 8. Number of Heuristic Rules Violated

Category	Navigation	Design	Content	Ease of Use	Supporting User Tasks
No. of Violations	9	19	8	13	8

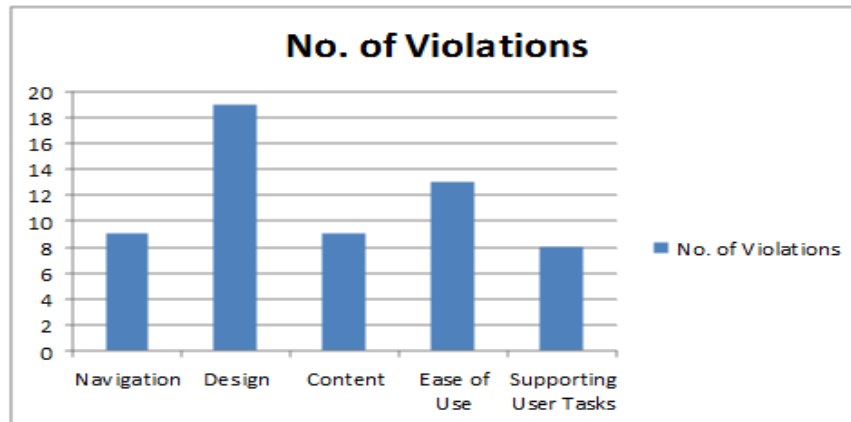


Figure - 6: Number of Heuristic Rule Violated

Some other problems identified:

1. In some pages menu items are left justified while in others they are right justified. (Design Problem)
2. Use of green color not good for color blinds. (Ease of Use)
3. Single, selected icon clearly visible when surrounded by unselected icons (Design Problem)
4. Current status of an icon is not clearly indicated. (There is no icon highlighted when selected, no stand out of icons from their background even).

Conclusion. In this paper different usability evaluation methods for evaluating the educational websites are discussed in the literature. In order to evaluate the usability of King Abdul Aziz website we have selected usability evaluation using Heuristics. This methodology gave us the useful insight into the website and exposed various usability problems in that particular website. Throughout this assessment, Heuristic evaluation was conducted by experts as well as by the survey done. By the results it is clear that the website doesn't conform to many standards of design, content, user support and navigation. Number of heuristic rules violations were also detected. We hope this research will be a profound addition to improve the usability of the King Abdul Aziz University website.

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